

Taxonomic problems in the *Erica filipendula* complex

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Thus far in *Yearbooks* we have described several new species of *Erica* which had been recently discovered. Sometimes new species are described because of the reassessment of characters within a species complex where it is deemed that the disjunctions between elements warrant specific recognition.

Erica filipendula forms such a species complex, which we have recently investigated, in the herbarium and in the field. It can have short, bell-shaped flowers which may be yellow or pale to dark pink, or white turning pink, or have long almost tubular flowers which are white or yellow-green (Figure 1). These shapes and colours are well shown in Plates 13A and 13B in *Ericas in Southern Africa* (Baker & Oliver 1967). However, we have found there are several distinct entities within this complex species.

Erica filipendula was described by Bentham in 1839 based on a collection made by James Bowie somewhere at the Cape between 1816 and 1822. He was a gardener sent out by Kew to collect seeds. We know that the flower-type of this collection was the open-mouthed bell with long narrow sepals as in Figure 1B, but unfortunately do not know the colour of the corolla. In 1904 in *Flora Capensis* with more material at his disposal, Bolus recognized the large-flowered form that he and several others had recently collected as something different and he described it as var. *major* (Figure 1A) and he also separated the small-flowered form with white to pinkish flowers as var. *minor* (Figure 1C & 1D). He noted that 'these three forms, unlike as they appear at first sight, can hardly be separated specifically.' It must be noted that at that period, variety (*varietas*) was the taxonomic rank used below the species; subspecies came into use later with variety being relegated to a lower, less important rank.

In 1964 Dulfer, in his revision of the genus, separated off part of Bolus' var. *minor* as a distinct species, *E. globulifera* Dulfer (Figure 1D), based on size only. There are, however, problems with his selection of material and the remaining small-flowered forms and there are additional characters not noted by

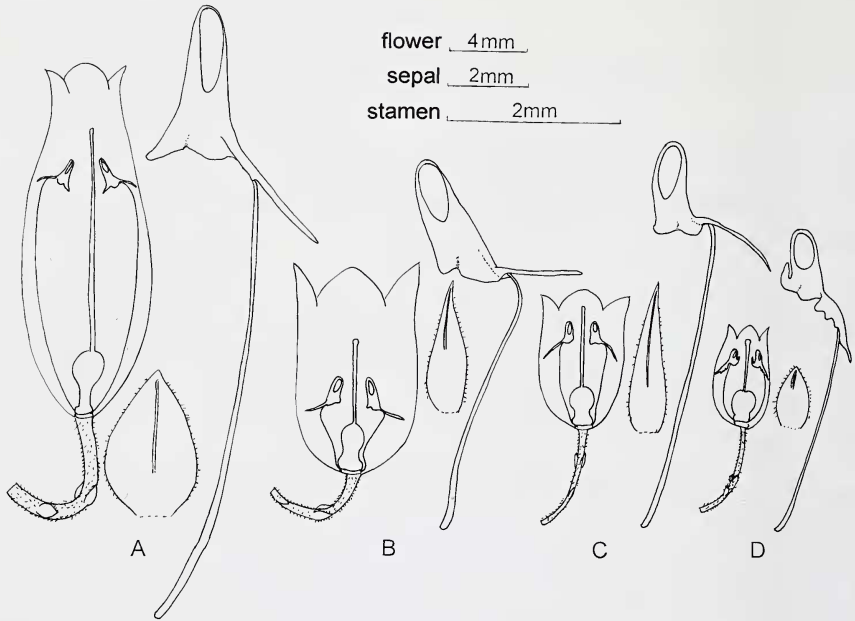


Fig. 1. Relationship of floral parts in A, *Erica penduliflora*; B, *E. filipendula* var. *filipendula*; C, *E. filipendula* var. *minor*; D, *E. globulifera*. Each part drawn to the same scale as given.

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Dulfer – broad anther appendages, broad sepals, and the upturned ‘nose’ on the anther. This we will be addressing in another publication. What concerns us here is the identity of the large-flowered var. *major*.

From the drawings in Figure 1 it is clear that the form figured as 1A, which matches var. *major* of Bolus, is distinctly different from the rest of the material figured due to the large, inflated, tubular corolla (12–18mm long), the longer stalk to the ovary, and the larger, broader sepals and is sufficiently distinct to warrant recognition at species level. *E. filipendula* var. *filipendula* (1B) and *E. filipendula* var. *minor* (1C) have long, lanceolate sepals and more open-mouthed, bell-shaped corollas 6–11mm long.

The position of the anthers within the corolla is important with 1A and 1B being very different but with 1A similar to 1C and 1D. This is clearly linked to the pollinating agent. We postulate that the long-flowered 1A is pollinated only by small sunbirds and that the short-flowered forms with more open corollas are pollinated by bees and other foraging insects, which can reach the supply of nectar. They would not be able to derive any rewards from a visit

to the large-flowered form and therefore no pollination would occur. This is only possible via the long-beaked/tongued sunbirds. The position and size of the 'noses' in the different forms is also variable and unusual and is part of the pollination syndrome where the anthers are held at the right position within the corolla (note the size and angle of the anther appendages). There are a number of species in the genus which have wide-open bells with the anthers placed towards the base of the flower. This feature we postulate is tied up with the type of insects involved in their pollination and is an aspect of the ericas which needs careful investigation.

We therefore describe this species here with the name *Erica penduliflora* seeing that it has loose, pendulous flowers – more so than in *E. filipendula* itself. Since Bolus included some five syntypes in the protologue of his var. *major* with no indication of which colour variant they were, we have chosen to describe the taxon as a new species. Bentham incorrectly assigned this species to *E. broadleyana* Andr. which was a horticultural hybrid raised in England in the early 1800s.

Erica penduliflora is a beautiful species in the wild with the typical colour form being pure white and contrasting very strongly with the duller coloured fynbos vegetation (Figure 5). Large bushes covered with many stunning synflorescences up to 300mm long are almost unequalled in the genus. It must be noted that each flower is a 1-flowered inflorescence borne on an extremely reduced lateral branchlet in the axil of a leaf on the main branch. The little branchlet bears highly reduced leaves (see lower right-hand portion of Figure 2C). This typical form appears to be confined to the quartzitic sandstone hills between Elim and Viljoenshof and Wolphuiskop in the west, an area where it used to be common (Figure 4). The populations have been reduced by the encroachment of alien vegetation, commercial flower picking and by the ploughing of the veld for the planting of orchards of proteas for commercial purposes or shrub removal for creating pastures.

Not far away on the flats in much drier areas is the form with yellow-green flowers growing in remnant vegetation on a mixture of sand and laterite typical of 'Elim fynbos'. The bushes are as large as those of the type but the synflorescences are mostly shorter. Towards Geelkop (Figure 7) and at Zoetanyenberg the yellow-green form grows in pure sand but sometimes on the flats in laterite soils. In the area west of Melkbospan it grows together with the small-flowered form of *E. filipendula* var. *minor* (Figure 1C) with its white to pink flowers in the same synflorescence. No hybrids were recorded between the two species in these populations.



Fig. 2. *Erica penduliflora*. A, flowering branch; B, stem, showing marked infraliolear ridges; C, flowering branchlet, showing the base of a single flower on a very reduced branchlet (inverted); D, leaf, adaxial view; E, flower; F, bract; G, bracteole; H, stamen, side, front and back views; I, stalked ovary; J, stigma. All drawn from the type, *Oliver 11245*. ©Inge Oliver

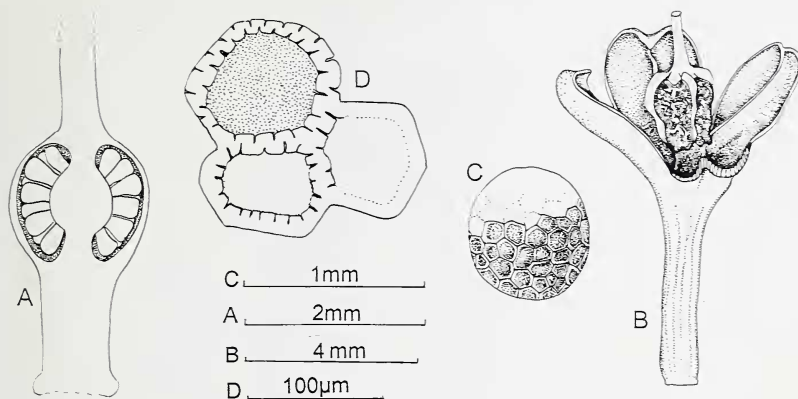


Fig. 3. *Erica penduliflora*. A, ovary cut open longitudinally; B, fruit; C, seed; D, testa cells. A, drawn from the type, Oliver 11245; B–D, from Williams 15. ©Inge Oliver

Many of the species confined to this whole area, including the beautiful *E. regia* Bartl. and its colour varieties, are in our opinion endangered due to poor farming practices and lack of environmental conservation strategies.

The plants of *E. penduliflora* flower over a long period from February to July.

Erica penduliflora E. G. H. Oliv., sp. nov.

Ericae filipendulae affinis sed corolla multo longiore alba vel flavoviride (non flava vel rosea), ore corollae angustiore (non corollam aequanti), sepalis ovatis (non lanceolatis), ovario longiore stipitate (non breve) differt. Figurae 2, 3 & 6.

TYPE: SOUTH AFRICA, Western Cape, 3419DA, Bredasdorp Dist., Viljoenshof, hills NW of, 120 m, 12 May 1999, white flowered, E.G.H. & I.M. Oliver 11245 (NBG, holotype; BM, BOL, K, MO, NY, P, PRE, S).

E. filipendula Benth. var. *major* Bolus in *Flora capensis* 4: 56 (1904). Syntypes: Bredasdorp, Div.; fairly abundant on the downs between Elim and Ratel River, 300–600ft, Guthrie 3786 (BOL, NBG!); *ibid.*, Bolus 8452 (BOL, NBG!, PRE); *ibid.*, Schlechter 7618 (BOL, NBG!, PRE) & Schlechter 7726 (BOL); *ibid.*, MacOwan [Schlechter] in *Herb. Aust. Afr.* 1920 (BOL!, SAM!).

E. broadleyana Benth. in De Candolle, *Prodromus* 7: 637 (1839) non Andrews, *Heathery* vol. v, t. 206 (1809).

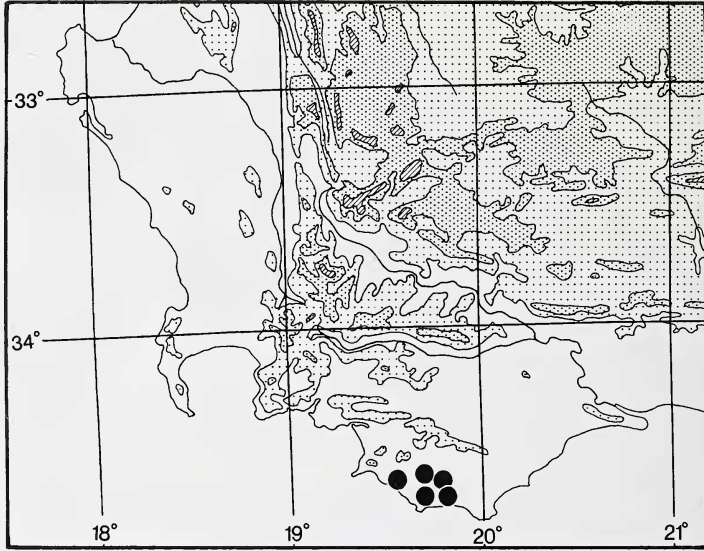


Fig. 4. Known distribution of *Erica penduliflora*.



Fig. 5. *Erica penduliflora*. Type population above Viljoenshof.



Fig. 6. *Erica penduliflora*. Close-up of synflorescences of type material.

ovate to elliptic, white, glabrous, margins shortly ciliate, no sulcus; **bracteoles** 2, adpressed, 0.7–1.0 x 0.9mm, otherwise like bract. **Calyx** 4-partite, adpressed to corolla; segments 3.5–4.3 x 2.0mm, laterally imbricate, the inner laterals often longer than the outer two, ovate, apex subacute, glabrous, white, keeled, sulcus two thirds length of segment, narrow, margins entire and shortly ciliate. **Corolla** 4-lobed, ± 12 – 18×5 – 6 mm, tubular-ovoid/ellipsoid, slightly contracted at the mouth, glabrous, smooth, white or yellow-green; lobes $\pm 1.5 \times 2.0$ mm, rounded, erect to semispreading. **Stamens** 8, free, included; filaments ± 12 mm long, (two thirds length of corolla), linear, curved adaxially at apex otherwise straight, glabrous, white; **anthers** bilobed, dorsally attached, elliptic in adaxial outline, thecae erect, $\pm 1.4 \times 0.5$ mm, lanceolate in lateral outline, prognathous with a marked acuminate adaxial 'nose' at base, dark brown, appendages thin, narrow, about as long as theca and attached for one third to half their length to apex of filament, with one or two short lateral teeth, white; **pollen** in tetrads. **Ovary** 4-locular, $\pm 3.0 \times 1.5$ mm with distinct ± 1.5 mm long stipe, globose glabrous green, with distinct basal nectaries; ovules ± 20 per locule spreading from a centrally placed placenta on axis; **style** included, filiform, glabrous; **stigma** simple-truncate with slightly raised stigmatic lobes. **Fruit** a dehiscent capsule, $\pm 8 \times 6$ mm with ± 4 mm long stalk, the valves opening to $\pm 45^\circ$, valves variably 40–60% from base to apex on columella and/or valve,

Shrub erect, well branched up to 1.5m tall, single-stemmed reseeder. **Branches:** a few thick main branches terminating in 3–8 secondary branches 100–250mm long, all with marked infrafoliar ridges, glabrous; numerous tertiary branchlets ± 1 mm long, puberulous, with two 5mm long leaf-like prophylls and two whorls of 1mm long coloured bract-like leaflets soon turning brown, these branchlets all terminating in a single-flowered inflorescence. **Leaves** 4-nate, erect, incurved, imbricate, 6–10 x 1.2mm, linear, adaxially flattened, abaxially rounded, margins acute scarious, apex acuminate; petiole ± 1 mm long, adpressed, glabrous. **Inflorescence: flowers** 1, at ends of very short tertiary branchlets, these numerous, arising from every node and aggregated along the secondary branches into spike-like synflorescences with oldest flowers terminal in the 'spike'; pedicel ± 6 mm long, curved, with dense very short spreading to reflexed hairs, white; **bract** partially recaulescent about one quarter up pedicel, adpressed, $\pm 0.8 \times 0.7$ mm, broadly



Fig. 7. *Erica penduliflora*. Population of yellow-green form in the Geelrug area.

brown with darker base and stalk; seeds ± 0.7 mm long, subglobose, reticulate, brown, testa cells $100\text{--}120 \times 80\text{--}100\mu\text{m}$, subequally hexagonal with thickly sclerified, highly convoluted anticlinal walls and numerous small pits in inner periclinal wall. Figures 2, 3 & 6.

PARATYPES (a selection of material examined): WESTERN CAPE.—3419:

WHITE COROLLA: (–DA), hills between Elim & Ratel River, 300ft, July 1895, *Bolus* 8452 (BOL, NBG, PRE); common about Elim, 3–600 ft, July 1895, *Guthrie* 3786 (BOL, NBG); hill-slopes N of Viljoenshof, April 1966, *Oliver* in STE 30151 (NBG, NY, PRE); *ibid.*, E.G.H. & I.M.Oliver 11301 (NBG, PRE); 250 m, 21–04–1983, *Schumann* 99 (NBG); Kouriver Mtns, 10–05–1929, *de Villiers* in STE 10564 (NBG); S slopes of Wolfhuiskop, 4km NE of Pearly Beach, 70m, 30–04–1981, *Burgers* 2700 (NBG).

YELLOW-GREEN COROLLA: (–DB), Viljoenshof area, flats just north of Vlooiakraal, 50 m, 12–05–1999, E.G.H. & I.M.Oliver 11246 (BM, K, NBG, NY, PRE); Viljoenshof-Blomfontein, April 1966, *Oliver* in STE 30150 (NBG, PRE); Geelrug; E slopes & flats, 200ft, 29–03–1971, *Oliver* 3348 (NBG, PRE); Voëlvlei to Hangnes, Geelrug, 250ft, 12–04–1982, *Oliver* 7680 (NBG, PRE); Voëlvlei area, slopes E of Geelrug Beacon, 80m, 12–05–1999, E.G.H. & I.M.Oliver 11248 (NBG, PRE); Zoetanyenberg, W end above Suuren-Soet, 500ft, 29–03–1971, *Oliver* 3359 (NBG, PRE); *ibid.*, W end just E of Melkbospan, 40 m, 12–05–1999, E.G.H. & I.M.Oliver 11253 (NBG).

COLOUR NOT RECORDED: (–DA), Elim, 400ft, 18–04–1896, *Schlechter* 7618 (BOL, NBG, PRE); *ibid.*, 250 ft, 05–1897, *Schlechter* in *Herb. Norm.* 1902 (BOL, SAM); without locality, *Thom* 1094 (BOL fragm. ex K).